

REMARKS/ARGUMENTS

These remarks are made in response to the Final Office Action of 22 July 2008 (Office Action). As this response is timely filed before the expiration of the 3-month shortened statutory period, no fees are believed to be due. However, the Examiner is authorized to charge any deficiencies or credit any overpayments to Deposit Account No. 50-3610.

Applicant thanks Examiner for the telephone interview held on October 20, 2008 to clarify how the references and the claims were being interpreted. It is believed that the presently amended claims will distinguish the claimed invention over the cited references.

Applicant has cancelled Claims 6-11 and added new Claims 19-23. The claims are supported by the originally filed application. In the following description, Applicant is referring to the paragraph numbering used in the originally filed application. Applicant notes that the application as published (US2005/0081083A1) corresponding to the present application has renumbered the paragraphs, and therefore the numbering of the published application may not correspond to those used herein.

Claim 19 claims a method for grid computing, as described, for example, by the title, paragraphs 001, 008, and 024. The method commences by dividing a computing task into portions, as supported by paragraph 025. The task relates to an n-body type problem, as defined in paragraph 023. Each portion relates to not more than one body as described, for example, in paragraph 027, and comprises data related to the body as described in paragraphs 028, 031. The method further commences by assigning the plurality of portions to a plurality of clients as supported by, for example, paragraph 030. Each client being configured to compute a result using the portion is supported by paragraphs 022 and 031, with each client connected to a network, as shown in FIG. 1. The plurality of clients processes their assigned respective portions as described in paragraphs 031. The results are transmitted or returned to a manager as shown in FIG. 7 (132), and described in paragraph 032 and the results are compiled as shown in FIG. 7

(137) and described in paragraph 032. The dividing, assigning, processing, and compiling is repeated in iterative cycles until the computing task is finished, as shown in FIGs. 3 and 7, and supported in paragraphs 035 and 033. While repeating, a client fails to return results for its assigned portion, as shown in FIG. 7 (132), and described in paragraph 033. In response to failing to receive results from a client, the method uses a previous result computed by the failed client during a previous cycle, as shown in FIG. 7 (134) and described in paragraph 033.

Claim 20 adds the limitation that multiple portions may be assigned to a client, as described in paragraph 030.

Claim 21 adds the limitation that the result not received from a failed client may be computed by a manager, as described in paragraph 040.

Claim 22 adds the limitation that the client failure is determined by either receiving a message that the client is no longer connected to the network, or upon the lapse of a predefined period of time, as supported in paragraph 032.

Claim 23 adds the limitation that upon a client failing to return results over a number of cycles, the portions are reassigned to another client, as supported by paragraph 040.

In the Office Action, the Examiner has rejected Claims 1-2 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pre-Grant Publication No. 2004/0098447 to Verbeke, *et al.* (hereinafter “Verbeke”) in view of U.S. Pre-Grant Publication No. 2005/0050382 to Beeston, *et al.* (hereinafter “Beeston”).

Applicant has rewritten Claim 1 to clarify that the clients are configured to produce a computational result by processing data in the portion assigned to the client. The results of such processing is to be returned to the manager. When a client fails to return its result, an approximation of the result is instead used by the manager. It is well known that a manager in a grid computing system receives results from clients for task portions assigned to those clients; that is the purpose of grid computing. It is also known that grid systems pre-empt client failures by redundant processing, where a given task portion is assigned to multiple clients for processing in case any one client fails.

Beeston was cited as showing approximation of results when a client fails to return a result, citing specifically to paragraph 0056 of Beeston. Beeston describes a system and method to estimate memory size to recover data. Beeston states in 0056 that if an error condition occurs (when writing data to a memory), a process estimates the size of the data block written to a destination node buffer and reserves memory space at a computer 105 proportional to the block size estimation. This, although efficient in data recovery, is not the same as estimating a processing result which would have been produced, for example, by the destination node 110 had the data been successfully acquired by the destination node and then processed. Applicant's claimed invention approximates results of a processing operation to be performed by a client, but which were not received from the client. Beeston does not show the claim limitation of approximating a result as claimed by Applicant.

In combining Beeston with a conventional grid computing system, what would result would be a grid system where, upon the manager transmitting the task portion to the client (assuming for the moment Beeston shows a "client"), the client buffers the task portion data, but fails to write it to a local destination medium. By application of the teachings of Beeston, the manager could recover the task portion data from the buffer by estimating the task portion block size, and reserving memory space in local memory at the manager to copy the contents of the buffer to the local memory. Beeston further does not describe or suggest using the recovered buffer contents for any purpose other than to merely recover the data. This neither produces a processing result, nor approximates a processing result. The conventional means of dealing with client failure, as cited in Verbeke and Anderson, are redundant processing. Taking into account that such conventional means of pre-empting client failure is known, and combining it with Beeston, the result fails to realize Applicant's claimed invention as claimed in Claim 1.

Beeston was further cited as showing Applicant's claimed means for determining that a client has failed "based upon at least one condition selected from a group of conditions consisting of: a receipt of a message indicating that the client is no longer connected to the network, a receipt of a message from the client indicating that said result is not forthcoming, and an expiration of a previously defined time delay for said client to provide said result." In the

telephone interview of October 20, 2008, Examiner indicated that Beeston was being interpreted as showing “a receipt of a message from the client indicating that said result is not forthcoming.” Beeston firstly does not indicate how the computer is informed that the buffer write operation failed. Second, as agreed, Beeston does not show computing a “result,” therefore even though it may be inferred that some mechanism is employed in Beeston as showing some indication from the destination node to the computer that the write failure occurred, it cannot be said such indication is that a “result,” as defined by the claims and specification, is not forthcoming.

Accordingly, as the combination of Verbeke and Beeston fails to realize Applicant’s claimed invention, Applicant respectfully submits that Claim 1 is distinguished over Verbeke in view of Beeston.

Claim 2 inherits all the limitations of Claim 1, and is therefore likewise considered to be allowable over Verbeke in view of Beeston.

Claims 3, 6, 8-9 and 12-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Verbeke, in view of Beeston, and in further view of “SETI@Home, an Experiment in Public-Resource Computing” by D.P. Anderson, *et al.* (hereinafter “Anderson”).

This section include the other independent Claims 12 and 13. Claims 12 and 13 recite substantially similar subject matter as is claimed in Claim 1. The arguments presented with regard to Verbeke and Beeston apply, therefore, equally with respect to Claims 12 and 13.

With regard to Claim 3, Applicant further claims the limitation that the result is the result of multi-cycle computation, and the approximation is based on a previously computed result received from the client. Anderson was cited as showing this limitation. However, what Anderson shows is not the same. Anderson, rather, shows the conventional failure handling means of redundant processing, where multiple clients are assigned the same task portion on which to operate, and provide results. If one client fails to return results, other redundantly assigned clients will likely provide the results. This is not the same as using a result obtained from the same client during a previous cycle. Applicant respectfully submits that Claim 3 is allowable.

Claims 12 and 13 were rejected for substantially the same grounds as Claim 1, with the addition of Anderson. The arguments made in regard to Claim 1 apply equally to the limitation of Claims 12 and 13. Anderson was cited as showing that the manager was approximating by using a result from a previous cycle, OR an initial value. Applicant has deleted the limitation that the approximation is based on an initial value. Anderson teaches redundant processing, but not use of results from a client on a previous cycle, as claimed by Applicant. Applicant notes that Aridor is mentioned in the rejection with regard to Claims 12 and 13, but then seems to be referring to Anderson since the SETE@home project is referred to. Neither the Aridor reference or the Anderson reference seem to have relevance at the cited location, "col. 1, lines 26-31." In Aridor col. 1, lines 26-31 refer to a "coherency protocol." Anderson at col. 1, lines 26-31 refers to non-natural signals received at a radio telescope as evidence of extraterrestrial technology. If further rejections are made using Anderson, Applicant respectfully requests Examiner clarify and quote the relevant portions of Anderson.

Claims 4-5, 7, 10-11, and 16-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Verbeke, in view of Beeston, and in further view of Anderson, and in further view of Aridor (2002/0038301).

Claims 7 and 10-11 have been cancelled. Claims 4-5, and 16-18 are dependent claims which Applicant believes are allowable as being dependent from allowable independent claims.

CONCLUSION

Applicant has shown how the 35 USC § 103(a) rejections should be withdrawn for reasons elaborated upon above. Further, the claims have been amended, which are fully supported by the Application. Applicant believes that the current Claims 1-5 and 12-23 are in a condition for allowance, which action is respectfully requested.

The Applicants request that the Examiner call the undersigned (954-745-0374) if clarification is needed on any matter within this Reply, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

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RCE dated 21 October 2008
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Respectfully submitted,

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